

**MALES OF *DINOCAMPUS COCCINELLAE* (SCHRANK)
(HYM.: BRACONIDAE: EUPHORINAE)**

MARK R. SHAW¹, IRENE E. GEOGHEGAN² & MICHAEL E. N. MAJERUS³

¹National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.

²Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA.

³Department of Genetics, Downing Street, Cambridge CB2 3EH.

IN VIEW OF the rarity of males (Geoghegan, Majerus & Majerus, 1998) of *Dinocampus coccinellae* (Schrank), a parasitoid of adult Coccinellidae, and the apparent lack of an adequate outline description of this sex in the literature (but see Wright, 1978), it is worth recording that a further three males have become available and that the four specimens now seen are closely similar to their females in general appearance and colouration, such that species level recognition should pose no problems.

The three males that have been available for detailed examination have been compared with 21 females selected at random from the same two rearing cohorts, arising from a heavily parasitised population of *Coccinella septempunctata* Linnaeus collected at Invergowrie, Dundee. From the date of collection, the insects were reared in an insectary at 18–20°C and 16:8 L:D, resulting in precocious development of the parasitoids (which would otherwise have overwintered inside their hosts). The first cohort comprised 50 ladybirds collected from raspberry, *Rubus idaeus* cv., at Invergowrie on 18.ix.97, of which 23 proved parasitised, giving rise to 19 viable cocoons ca 16.x.97, and 1 ♂ 18 ♀ *D. coccinellae* on about 27.x.97. The second cohort comprised 85 ladybirds collected in the same place on 13.xi.97, of which 61 proved parasitised, giving rise to 53 cocoons on about 7.xii.97, and 2 ♂ 51 ♀ *D. coccinellae* on around 18.xii.97. Overall 71 ♀ ♀ (50 parasitised) and 64 ♂ ♂ (38 parasitised) ladybird hosts were involved. The three male parasitoids all resulted from female hosts.

Morphologically, *Dinocampus coccinellae* is a distinctive euphorine (Shaw, 1985), being the only known species in the genus *Dinocampus* Foerster, which itself is amply characterised by the rugo-punctate sculpture of its first metasomal tergite, together with the disposition of the vein dividing the first discal and first submarginal cells in the forewing (RS+M *sensu* Shaw & Huddleston, 1991; 1-SR+M *sensu* van Achterberg, 1993), which is directed strongly downward so that there is a distinct second abscissa (2-SR+M *sensu* van Achterberg, 1993), i.e., between its junction with the “recurrent” or transverse mediocubital vein (1 m-cu *sensu* Shaw & Huddleston 1991; m-cu *sensu* van Achterberg, 1993) and the radical sector (IRs *sensu* Shaw & Huddleston, 1991; 2-SR *sensu* van Achterberg, 1993). Both characters apply equally to the two sexes.

In colour, the male is black; but head largely (except for black stemmaticum and dorsolateral borders of occiput), mouthparts, fore coxae below, fore tibiae and femora, mid and sometimes hind femora centrally, and their tibiae obscurely, orange-brown; prosternum (sometimes) and all tarsi dark brown; wing membrane

weakly infumate and most of venation (except for black pterostigma) brownish. Females differ in colour principally in having the metasoma more or less extensively orange-brown posterolaterally (wholly black, except for a small brownish mark in the spiracular region of tergite 2, even in life in the three males so examined), and on average slightly lighter leg colouration. The three males examined in detail, possibly in contrast with the specimen recorded by Geoghegan, Majerus & Majerus (1998; see also Wright, 1978), which is no longer available for examination, are comparable with the females from the same locality in body proportions or even a little stouter (e.g., post-petiole often wider and more rectangular, because spiracles situated on more pronounced angulations – but very variable in the females seen, some of which are markedly asymmetric), and their second metasomal tergites have an appreciably more extensive development of scattered weak striate to rugo-punctate sculpture than in the females. In this population at least, the number of antennal segments seems to be highly conserved, but there is a small sexual difference. The three males whose antennal segments could be counted all had 23, one less than all 21 of the females examined from the same reared cohorts. The shapes of the antennal segments in the two sexes are broadly similar. It is worth noting in passing that of 13 other females with at least one intact flagellum in the National Museums of Scotland that had been reared from *C. septempunctata* in various parts of Britain, eight have 24 segments and five have 23. Two females reared from the markedly smaller host *Coccinellae undecimpunctata* L. have 22 segmented antennae, and one female supposedly reared from *Adalia bipunctata* (L.), but lacking host remains, has 23. Some of these counts are, however, rather arbitrary owing to the sometimes somewhat ambiguous separation of the apical segment.

At various times over several days, these males were observed apparently courting females with which they were confined along with diluted honey, exhibiting the behaviour recorded by Geoghegan, Majerus & Majerus (*in press*) for the earlier individual, and experiencing the same rejection. These three males have now been deposited in the National Museums of Scotland.

References

- Achterberg, C. van., 1993. Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonidea). *Zoologische Verhandelingen* **283**: 1-189.
- Geoghegan, I.E., Majerus, T.M.O. & Majerus M.E.N., 1998. A record of a rare male of the parthenogenetic parasitoid *Dinocampus coccinellae* (Schrank) (Hym.: Braconidae). *Entomologist's Rec. J. Var.* **110**: 171-172.
- Shaw, M.R. & Huddleston, T., 1991. Classification and biology of braconid wasps (Hymenoptera: Braconidae). *Handbooks for the Identification of British Insects* **7**(11): 1-126.
- Shaw, S.R., 1985. A phylogenetic study of the subfamilies Meteorinae and Euphorinae (Hymenoptera: Braconidae). *Entomography* **3**: 277-370.
- Wright, E.J., 1978. Observations on the copulatory behaviour of *Perilitus coccinellae* (Hymenoptera: Braconidae). *Proceedings of the Entomological Society of Ontario* **109**: 22
-
-